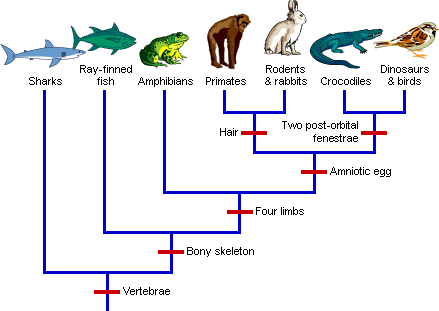
READING CLADOGRAMS

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period:\_\_\_\_\_\_\_\_\_\_\_\_\_

For each of the figures below, answer the following questions.



1. What derived character (evolutionary changes) separate sharks from other fish?  
  
  
2. How many derived characters separate ray-finned fish from crocodiles?  
  
  
3. Which is more related and why?

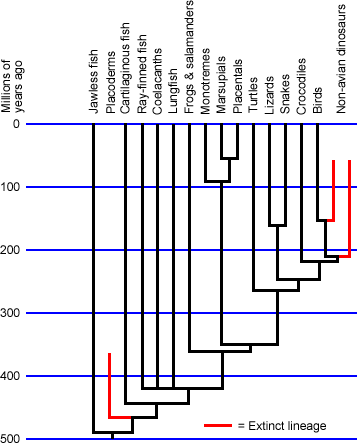
a. Primates and amphibians

b. Primates and rodents/rabbits

c. Sharks and ray-finned fish

4. What is one derived character that all of the organisms in this cladogram share?  
  
  
5. Which groups of organisms have an amniotic egg?

6. Are primates more specialized than birds? Why or why not?



1. Which group would be considered the outgroup?

2. About how many million years ago did the non-avian dinosaurs die out?

3. Which living species is closest to the non-avian dinosaurs?

4. Approximately how many million years ago did marsupials and placentals split off from each other?

5. Approximately how many million years ago did the split between frogs & salamanders and the clade containing monotremes through non-avian dinosaurs occur?

6. How far back does this tree go?

7. How many groups of organisms are represented?

8. How many of them are still around?

9. How many derived characters separate jawless fish from cartilaginous fish?

10. Which pair is the most closely related and why?

a. Turtles and crocodiles

b. Lungfish and frogs & salamanders

c. Cartilagenous fish and frogs & salamanders

NOW IT’S YOUR TURN

At the lab tables, you will find a set of some like objects. Draw and justify your own cladogram.

Make sure you include the following:

1. Which is the outgroup?
2. What are some of your derived characters?
3. A name for each of the lines on your cladogram.
4. A title for your cladogram
5. Your reasoning behind each separation.